**September 26, 2002**

Draft 2

# Surface Observation BUFR message format

Our goal is a flexible format that will encompass surface data measurements regardless of the type of instrumentation used to acquire them, enabling future data processing systems to operate with a minimum of software development.

Also, in order to avoid time delays encountered due to data organization, we propose a single stationís measurements for a single time period in each individual message. Our single most heard complaint about current data delivery is that it isnít as timely as could be, especially for use in NWP.

Proposed BUFR definition for surface observations:

| ***Data Field*** | ***Element Name*** | ***Table B Descrip*** | ***Scale (10**n)*** | ***Reference (-n)*** | ***Width (Bits)*** | ***Units*** | ***Comments*** |
|---|---|---|---|---|---|---|---|
| 1 | WMO Block # | 0 01 001 | 0 | 0 | 7 | Numeric | (3 1 32) (3 1 1) MBM |
| 2 | WMO Station # | 0 01 002 | 0 | 0 | 10 | Numeric | (3 1 32)(3 1 1) MBM |
| 3 | Type of Station | 0 02 001 | 0 | 0 | 2 | Code Table | (3 1 32) 0 = automatic |
| 4 | Year | 0 04 001 | 0 | 0 | 12 | year | (3 1 32) (3 1 11) |
| 5 | Month | 0 04 002 | 0 | 0 | 4 | month | (3 1 32) (3 1 11) |
| 6 | Day | 0 04 003 | 0 | 0 | 6 | day | (3 1 32) (3 1 11) |
| 7 | Hour | 0 04 004 | 0 | 0 | 5 | hour | (3 1 32) (3 1 12) |
| 8 | Minute | 0 04 005 | 0 | 0 | 6 | minute | (3 1 32) (3 1 12) |
| 9 | Latitude (Low Accuracy) | 0 05 002 | 2 | -9000 | 15 | Degrees | (3 1 32)(3 1 24) |
| 10 | Longitude (Low Accuracy) | 0 06 002 | 2 | -18000 | 16 | Degrees | (3 1 32)(3 1 24) |
| 11 | Height of Station | 0 07 001 | 0 | -400 | 15 | m | (3 1 32)(3 1 24)Elevation AS |
| 12 | Station short name | 0 01 018 | | | 40 | CCITT IA5 | MBM |
| 13 | Time Significance | 0 08 021 | 0 | 0 | 5 | | 2 = Time Averaged |
| 14 | Averaging Time Period | 0 04 026 | 0 | -4096 | 13 | Seconds | -360 or -3600 for NPN (note |
| 15 | Wind Speed | 0 11 002 | 1 | 0 | 12 | $m.s^{-1}$ | |
| 16 | Wind Direction | 0 11 001 | 0 | 0 | 9 | Degrees true | |
| 17 | Pressure | 0 10 004 | -1 | 0 | 14 | Pa | Station pressure |
| 18 | Sea level pressure | 0 10 051 | -1 | 0 | 14 | Pa | Pressure reduced to mean s |
| 19 | Temperature | 0 12 001 | 1 | 0 | 12 | K | |
| 20 | Relative Humidity | 0 13 003 | 0 | 0 | 7 | % | |
| 21 | Rainfall Rate | 0 13 014 | 4 | 0 | 12 | $Kg.m^{-2}.s^{-1}$ | |
| | | | | | | | |

Legend: MBM = May Be Missing, if station not permanent

Note 1: This number is negative to denote the fact we were averaging over the PREVIOUS n seconds, relative to the time-stamp of the data.

Note 2: 0,10,51 added 26 September 2002 because some stations report both station pressure and a calculated sea-level pressure